EtherLink® XL PCI 10 Mbps Network Interface Cards User Guide

Member of the 3Com EtherLink XL family of network interface cards

http://www.3com.com/

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ABOUT THIS GUIDE

About This Guide provides an overview of this guide, describes guide conventions, and tells you where to look for specific information.

This guide describes how to install, configure, and troubleshoot 3Com® EtherLink® XL PCI 10 Mbps (3C900B) network interface cards (NICs).

If a release note is shipped with this product, and the information in the release note differs from the information in this guide, follow the instructions in the release note.

This guide is for network administrators and users who are familiar with PCs and Ethernet networks.

Finding Specific Information in This Guide

This table shows the location of specific information in this guide.

If you are looking for	Turn to
NIC installation and cabling information	Chapter 1
Network driver installation instructions	Chapter 2
Information about troubleshooting installation problems	Chapter 3
Information about changing NIC configuration settings	Chapter 4
Specifications, cable requirements, and RJ-45 pin assignments	Appendix A
Information about advanced PACE™ options	Appendix B
Information about crossover cables and troubleshooting techniques	Appendix C
Technical support	Appendix D

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Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Description
	Information note	Important features or instructions
	Caution	Information to alert you to potential damage to a program, system, or device
	Warning	Information to alert you to potential personal injury

Table 2 Text Conventions

Convention	Description
`Screen displays`	This typeface represents information as it appears on the screen.
The words “enter” and “type”	When you see the word “enter” in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says “type.”
Keyboard key names	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press Ctrl+Alt+Del
Menu commands and *buttons*	Menu commands or button names appear in italics. Example: From the *Help* menu, select *Contents*.
Words in *italicized* type	Italics emphasize a point or denote new terms at the place where they are defined in the text.
Words in **bold-face** type	Bold text denotes key features.

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1 INSTALLING THE NETWORK INTERFACE CARD

This chapter describes the 3Com® EtherLink® XL PCI 10 Mbps 3C900B network interface cards (NICs). Procedures are provided for installing the NIC hardware and software and connecting each version of the NIC to an Ethernet network.

Figure 1-1 shows the two versions of the 3C900B NIC. These NICs connect your PC to a 10 Mbps Ethernet network using up to three different types of media.

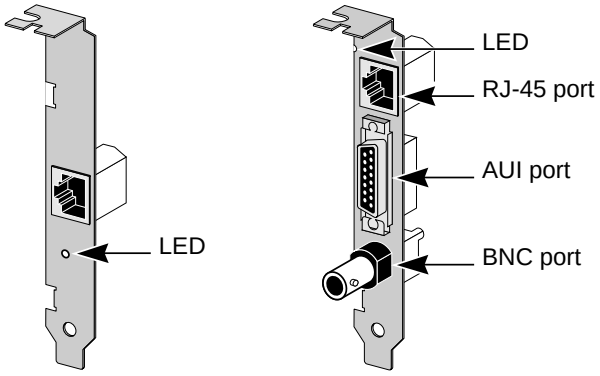

Figure 1-1 3C900B Network Interface Cards

Table 1-1 shows the cable, connector, transceiver, and maximum network segments for the various 3C900B NIC models.

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Table 1-1 3C900B NIC Models

NIC Model	Cable	Connector	Transceiver	Maximum Network Segment
3C900B-TPO	Category 3, 4, or 5 unshielded twisted-pair (10BASE-T)	RJ-45	On-board	328 ft/100 m
3C900B-COMBO	Category 3, 4, or 5 unshielded twisted-pair (10BASE-T)	RJ-45	On-board	328 ft/100 m
	10BASE5 thick Ethernet coaxial	15-pin AUI	External	1640 ft/500 m
	10BASE2 thin Ethernet coaxial	BNC	On-board	1000 ft/305 m

Preparing for Installation

Before you install the 3C900B NIC, verify that you have all of the components. If any of these items are damaged or missing, contact your shipper or network supplier.

- EtherLink XL PCI NIC (3C900B)
- *EtherLink XL PCI Network Interface Cards User Guide* (this guide)
- 3Com 3C900B *EtherDisk* diskettes 1 and 2

You also need to know the following about your network environment:

- The kind of network cabling that is used to connect to the network at your site. You must use the same kind of network cable. The NIC that you install in your PC must have a port that matches the connector on the network cable that you use.
- Your network protocol (IPX, NetBEUI, or TCP/IP).

The next step is to install the NIC in the PC.

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Inserting the NIC

The following instructions apply to installing the 3C900B NIC in most PCs. If these instructions are not appropriate for your PC, refer to the documentation that accompanied your PC.

CAUTION: *Each NIC is packed in antistatic packaging to protect it during shipment. Before handling the NIC, touch the bare metal case of your PC. While you are handling the NIC, wear a wrist strap grounded to the PC chassis.*

Remove all jewelry from your hands and wrists and use only insulated or nonconducting tools.

Follow these steps to install the NIC in your PC:

1. **Turn the power off, and remove the power cord from the PC.**
2. **Unscrew the cover screws and remove the cover.**

   On some PCs, it may be necessary to remove all cables before the cover can be removed.
3. **Locate an available bus-mastering PCI slot and remove the screw from the corresponding backplate (Figure 1-2). Save the screw.**

Early PCI PCs that have more than one PCI slot typically have only one bus-mastering PCI slot. In this case, the correct PCI slot to use is usually the one closest to the power supply in the PC. However, you should consult your PC documentation to verify this. In newer PCI systems, all PCI slots are bus-mastering slots.

Many PCs have both ISA and PCI slots. Make sure that you install the NIC only in a bus-mastering PCI slot. See Figure 1-2. PCI slots are usually white, and they are shorter than ISA slots.

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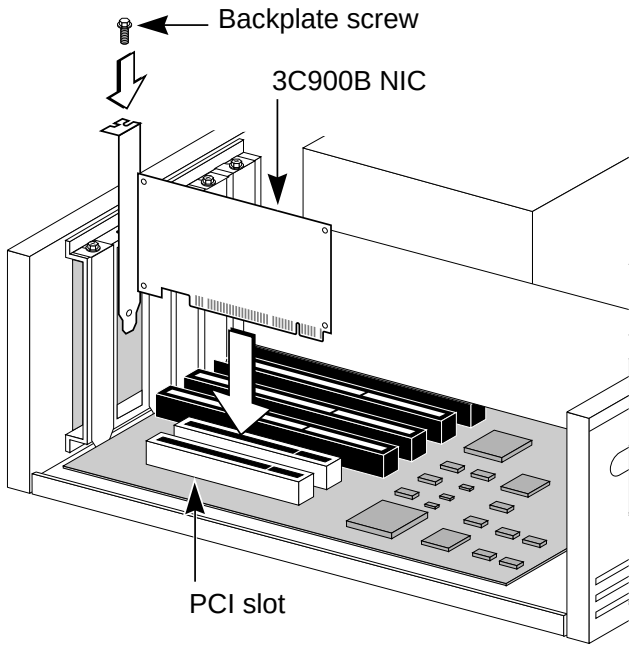

Figure 1-2 Installing the 3C900B NIC

4 **Remove and discard the backplate.**

5 **Ensure that the shape and length of the edge connector on the NIC match the slot that you intend to use (Figure 1-2).**

6 **Carefully insert the NIC into the slot. Press firmly with steady pressure to ensure that the NIC is fully seated in the slot.**

When the NIC is correctly inserted in the slot, the NIC backplate is flush with the PC backplane.

7 **Secure the NIC with the backplate screw.**

8 **Replace the PC cover. Reinsert and tighten the cover screws.**

9 **Reconnect all power and peripheral cables.**

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Connecting to the Network

This section describes how to connect the 3C900B NIC to an Ethernet network using an RJ-45, BNC, or AUI port. Each 3C900B NIC provides different network ports, as shown in Figure 1-1. Follow the procedure for the network port on the NIC that you install.

When you first install the NIC and power on the PC, the LED on the NIC backplate lights, but the link is not active. To enable the link, you must load the network drivers. See "Interpreting the Link LED" at the end of this chapter for more information.

RJ-45 Port

Follow these steps to connect the RJ-45 port on the 3C900B-TPO and COMBO NICs to the network:

1 **Plug the RJ-45 connector on the twisted-pair network cable into the RJ-45 port on the NIC backplate. See Figure 1-3.**

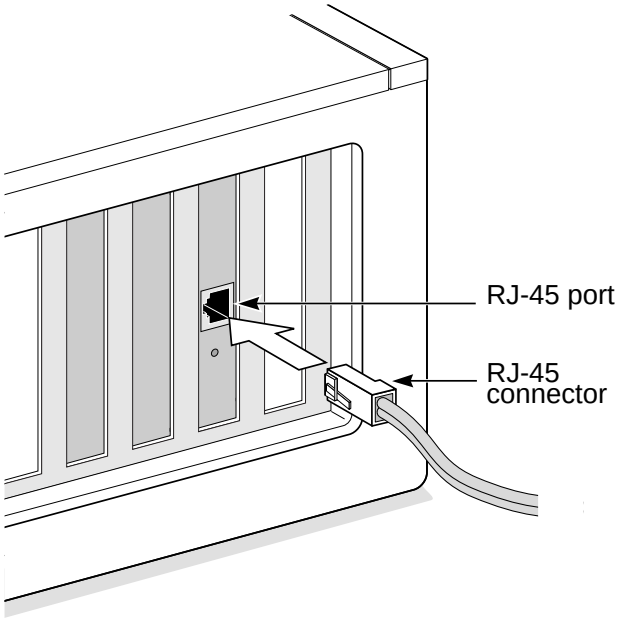

Figure 1-3 Connecting to the RJ-45 Port on the 3C900B NIC

2 **Connect the other end of the network cable to an active network port.**

Go to "Interpreting the Link LED" later in this chapter.

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BNC Port

Follow these steps to connect the BNC port on the COMBO NIC to the network:

1 **Connect the BNC connector on the thin Ethernet coaxial cable to the BNC port on the NIC. See Figure 1-4.**

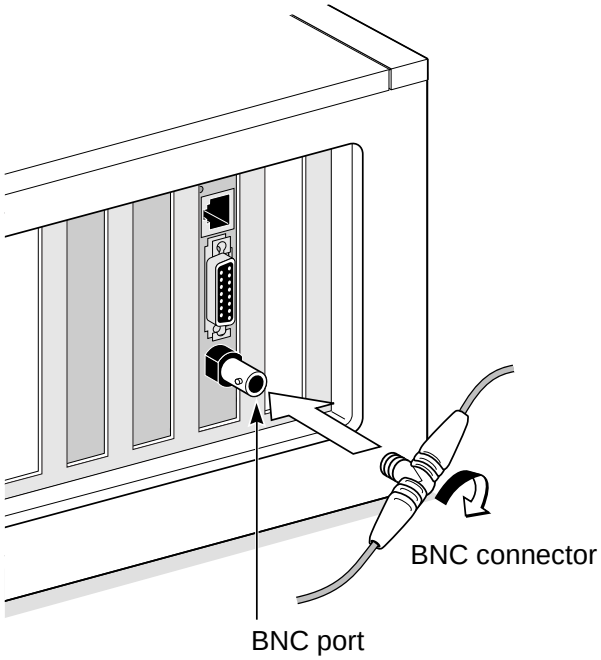

Figure 1-4 Connecting to the BNC Port on the 3C900B-COMBO NIC

2 **Connect the other end of the network cable to another PC or a 50-ohm terminator.**

If your PC is the last physical device in the network daisy chain, you must connect a 50-ohm terminator to the other end of the BNC T-connector.

The next step is to install the network driver. Go to the next chapter.

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AUI Port

Follow these steps to connect the AUI port (Figure 1-5) on the 3C900B COMBO NIC to the network:

1 **Locate the 15-pin AUI port on the NIC and move the slide latch down to the open position.**

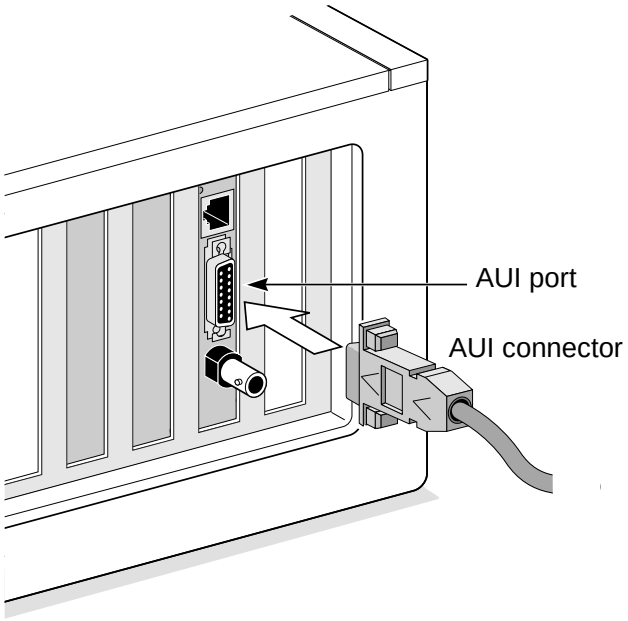

Figure 1-5 Connecting to the AUI Port on the 3C900B-COMBO NIC

2 **Connect the thick Ethernet coaxial cable to the AUI port on the NIC.**

This connector attaches in only one way. Orient the AUI connector to match the AUI port on the NIC.

3 **Move the slide latch up to the closed position to lock the AUI connector in place.**

4 **Connect the other end of the network cable to an external transceiver.**

The next step is to install the network driver. Go to the next chapter.

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Interpreting the Link LED

The 3C900B NICs have one light-emitting diode (LED). When the LED is on (but before the driver is loaded), the LED indicates that the NIC is receiving power.

Other than indicating that the NIC is receiving power, the LED serves no other purpose for either an AUI or a BNC media connection. Table 1-2 explains the LED states for 3C900B NICs.

Table 1-2 LED Interpretation

		Connector		
LED State	**Meaning**	**RJ-45**	**AUI**	**BNC**
On	If drivers are installed, the connection is active.	Yes	N/A	N/A
	If drivers are not installed, the NIC is receiving power.	Yes	Yes	Yes
Off	Something is preventing the connection between the NIC and the hub.	Yes	N/A	N/A
Blinking	The cable polarity is reversed. Try a different network cable or contact your MIS representative.	Yes	N/A	N/A

If the NIC LED indicates a problem, check the following:

1 **Ensure that your network hub and the network cable connecting to your 3C900B NIC comply with the 10BASE-T specifications.**

2 **Ensure that the hub is powered on.**

You have completed the hardware installation.

The next step is to install the network driver. Go to the next chapter.

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2 INSTALLING THE NETWORK DRIVER

This chapter describes how to install the network driver that allows the 3C900B NIC to transmit and receive data over an Ethernet network.

To obtain the latest shipping version of a network driver, go to the 3Com World Wide Web site:

http://www.3com.com/

Before attempting to install a network driver, ask your network administrator which driver to install.

Go to the appropriate section in this chapter for the procedure describing how to install the driver for the network used at your site.

Windows 95

This section describes how to install the 32-bit protected-mode driver in a PC running Microsoft Windows 95. This driver can be used in both Microsoft and NetWare environments, and it supports dRMON and PACE™ technology.

Do not use the AutoLink software to install the network driver under Windows 95. To install the network driver under Windows 95, you need the Windows 95 installation files. These files may be on a CD or standard diskettes, or they may have been copied to your hard disk when Windows 95 was installed on your system.

The version of Windows 95 installed on your PC determines which of the following driver installation procedures to use.

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Follow these steps to determine the Windows 95 version installed on your PC:

1 **Right-click the My Computer icon and click *Properties*.**

The System Properties window is displayed.

2 **Check the version number on the General screen, under System:**

- If 4.00.950 is displayed, follow the procedure for Windows 95 Build 950.
- If 4.00.950B is displayed, follow the procedure for Windows 95 OSR2.

Windows 95 Build 950

Follow these steps to install the network driver in a PC running the Build 950 version of Windows 95:

1 **Install the NIC, connect to the network, and turn the power on.**

Windows 95 detects the NIC and displays the New Hardware Found dialog box, prompting you for the driver you want to install for your new hardware.

2 **Select *Driver from disk provided by hardware manufacture*r, and then click *OK*.**

The Install from Disk dialog box is displayed.

3 **Insert *EtherDisk* diskette 2 in drive A and enter the path to drive A if it is not already displayed.**

4 **Click *OK*.**

- If this is the first time that networking is being installed on your PC, the Identification tab of the Network window is displayed. Go to step 5.
- If networking has already been installed, you are prompted for the Windows 95 CD. In this case, go to step 7.

5 **In the specified fields of the Identification tab screen, enter:**

- The name of your computer

  Give your PC a unique name of up to 15 characters. Spaces are not allowed; however, you can use hyphens.

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- Your workgroup name

  A workgroup (for example, your department name) is composed of the PCs you usually communicate with and the workgroup's shared resources (for example, printers).

  If you use peer-group networking, the workgroup name is your peer group. Peers can see each other when they look in the Network Neighborhood.

  For information on peer-to-peer networking, see the W95NDIS.TXT file in the HELP directory on *EtherDisk* diskette 1.

- A description of your computer

  Filling in this field is optional. The information that you enter in this field is visible to others when they view your computer on the network. The description should help others to know the function or use of your PC.

6 **Click *Close.***

Files are copied and you are prompted for the Windows 95 CD.

7 **Click *OK*.**

The Copying Files dialog box is displayed.

8 **Remove *EtherDisk* diskette 2 from drive A.**

9 **If not already displayed, enter the path to the CD-ROM drive, insert the Windows 95 CD in the CD-ROM drive, and click *OK*.**

Files are copied, and you are then prompted to restart your computer.

10 **Click *Yes*.**

Windows prompts you to enter your name and network password.

11 **Enter your user name and password, and then click *OK*.**

To confirm successful installation, go to "Confirming Installation" later in this chapter.

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Windows 95 OSR2

Follow these steps to install the network driver in a PC running the OSR2 version of Windows 95:

1 **Install the NIC, connect to the network, and turn the power on.**

Windows 95 detects the NIC. The Update Device Driver Wizard starts and prompts you for a diskette or CD.

2 **Insert *EtherDisk* diskette 2 in drive A and click *Next*.**

Windows finds the driver and asks if you want to use this driver.

3 **Click *Finish*.**

The Insert Disk dialog box prompts you for *EtherDisk* diskette 2.

4 **Click *OK*.**

The Copying Files dialog box is displayed.

5 **If not already displayed, enter the path to drive A.**

6 **Click *OK*.**

- If this is the first time that networking is being installed on your PC, the Identification tab of the Network window is displayed. Go to step 7.
- If networking has already been installed, you are prompted for the Windows 95 CD. In this case, go to step 9.

7 **In the specified fields of the Identification tab screen, enter:**

- The name of your computer

  Give your PC a unique name of up to 15 characters. Spaces are not allowed; however, you can use hyphens.

- Your workgroup name

  A workgroup (for example, your department name) is composed of the PCs you usually communicate with and the workgroup's shared resources (for example, printers).

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If you use peer-group networking, the workgroup name is your peer group. Peers can see each other when they look in the Network Neighborhood.

For information on peer-to-peer networking, see the W95NDIS.TXT file in the HELP directory on *EtherDisk* diskette 1.

- A description of your computer

  Filling in this field is optional. The information that you enter in this field is visible to others when they view your computer on the network. The description should help others to know the function or use of your PC.

8 Click *Close.*

Once the installation files are copied to your hard disk, Windows prompts you for the Windows 95 CD.

9 Click *OK*.

10 Remove *EtherDisk* diskette 2 from drive A and click *OK*.

The Copying Files dialog box is displayed.

11 If not already displayed, enter the path to the CD-ROM drive, insert the Windows 95 CD in the CD-ROM drive, and click *OK*.

Windows 95 prompts you to reboot.

12 Click *Yes*.

Windows prompts you for your user name and password.

13 Enter your user name and password, and then click *OK*.

To confirm successful installation, go to the next section.

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Confirming Installation

Follow these steps to confirm that the NIC is installed and functioning correctly:

1 **Right-click the My Computer icon, click *Properties*, and then click the Device Manager tab.**

A list of devices appears, arranged by type.

2 **Double-click *Network adapters*.**

The name of the installed NIC appears:

`3Com EtherLink XL xxx 10 Mb Ethernet NIC (3C900B-xxx)`

where xxx represents the NIC model installed in your PC, for example, TPO.

If a yellow exclamation point (!) or a red X appears next to the NIC name, go to "Frequently Asked Questions" in Chapter 3 to troubleshoot the NIC.

3 **Double-click the name of the NIC to display a description of the NIC and its current status.**

The message in the Device status panel confirms that the 3C900B NIC is working properly.

4 **Click *Cancel* to close each dialog box. Then close the Control Panel and My Computer windows.**

You have successfully installed and configured the 3C900B NIC.

Windows NT

This section describes how to install the network driver in a PC running Microsoft Windows NT 4.0 or 3.51.

Do not use the AutoLink software to install the network driver under Windows NT.

If Windows networking is not installed on your PC, you may also need the following information from your network administrator:

- Whether you are on a LAN or are connecting to one through a modem
- The protocol used in the Microsoft Windows network (typically TCP/IP or NetBEUI)

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- The name of the Windows NT server domain or workgroup that you belong to
- The IP address that you will use if your network does not have a DHCP server (TCP/IP only)

Windows NT 4.0

Follow these steps to install the network driver in a PC running Windows NT 4.0:

1. **Install the NIC, connect to the network, and turn the power on.**
2. **Double-click the My Computer icon, double-click the Control Panel icon, and then double-click the Network icon.**

   The Network window appears.
3. **Click the Adapters tab.**

   If you are replacing a NIC that was previously installed, follow these steps. Otherwise, go to step 4.

   a Select the existing NIC (that is being replaced) in the Installed Adapters group.

   b Click *Remove*.

   c Click *Yes* in the Warning dialog box.

   d Reboot the PC and repeat step 2.
4. **Click *Add*.**

   The Select Network Adapter dialog box appears.
5. **Click *Have Disk*.**
6. **Insert *EtherDisk* diskette 2 in drive A, enter the path to drive A if it is not already displayed, and click *OK*.**

   The OEM Option dialog box appears.
7. **If not already selected, select *3Com Fast EtherLink/EtherLink XL PCI Busmaster NIC*, and click *OK*.**

   Windows copies files, and then the Setup Message dialog box confirms that 3Com dRMON SmartAgent® software has been successfully installed.

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8 **Click *OK*.**

The 3Com NIC Diagnostics window appears, confirming successful driver installation.

9 **Click *Close*.**

The Network window appears, displaying the name of the installed NIC.

10 **Click *Close*.**

If you are prompted for network information, enter the information supplied by your MIS department.

Windows prompts you to restart your computer.

11 **Click *Yes*.**

The driver installation is complete.

To confirm successful installation, double-click the Network icon in the Control Panel. Click the Adapters tab. The 3C900B NIC should appear on the list. If it is not on the list, see Chapter 3 for troubleshooting information.

Windows NT 3.51

Follow these steps to install the network driver in a PC running Windows NT 3.51:

1 **Install the NIC, connect to the network, and turn the power on.**

2 **In the Main window of the Program Manager, double-click the Control Panel icon and then double-click the Network icon.**

The Network Settings window appears.

If you are replacing a NIC that was previously installed, follow these steps. Otherwise, go to step 3:

a Select the existing NIC in the Installed Adapters Cards group.

b Click *Remove*.

c Click *Yes* in the confirmation window.

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d Click *OK* in the Network Settings window and then click *Restart Now*.

e After rebooting, repeat step 2.

3 Click *Add Adapter.*

The Add Network Adapter window appears.

4 Click the down arrow to expand the list box, select *<Other> Requires disk from manufacturer*, and then click *Continue*.

The Select OEM Option dialog box appears with the name of the NIC displayed and selected.

5 Click *OK*.

Windows copies files, and then the Setup Message dialog box confirms that 3Com dRMON SmartAgent software has been successfully installed.

6 Click *OK*.

The 3Com NIC Diagnostics window is displayed, confirming successful installation of the Windows driver.

7 Click *Close*.

8 Click *OK* in the Network Settings window.

If you are prompted for network information, contact your network administrator for the requested information and then follow the prompts.

Windows completes the installation and prompts you to restart Windows NT.

9 Click *Restart Now*.

The driver installation is complete. To confirm successful installation, double-click the File Manager icon. The presence of network server names in the File Manager confirms successful installation.

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Novell NetWare Client Driver

This section describes how to install the Novell NetWare client driver for a PC running DOS, Windows 3.x, or Windows for Workgroups. You use 3Com AutoLink software to install DOS client software and drivers for Novell NetWare 3.1x or 4.x.

Do not use the AutoLink driver installation software if you are running Windows 95 or Windows NT. See the previous sections in this chapter for procedures to install network drivers under these operating systems.

AutoLink software modifies the CONFIG.SYS and AUTOEXEC.BAT files. It adds several lines to the AUTOEXEC.BAT file and saves the old file as AUTOEXEC.3CM. It also adds lines to the CONFIG.SYS file and saves the old file as CONFIG.3CM.

AutoLink software logs on to the server and updates the client software if your MIS department has already configured a 3Install account on your server.

To use AutoLink software, your PC should have only one 3C900B NIC installed and at least 1 MB of available hard disk space.

Running AutoLink Software

Follow these steps to run AutoLink software to install the DOS client software and drivers for a NetWare network:

1. **Install the NIC, connect to the network, and reboot using a DOS diskette.**
2. **Insert *EtherDisk* diskette 1 in drive A.**
3. **Run the Install program. Enter:**

   `a:install`

   The main menu is displayed.
4. **Select *Auto Install and Config for NetWare (AutoLink)* and press Enter.**
5. **Select *DOS*, *Windows 3.1x*, or *Windows for Workgroups 3.11,* and follow the instructions.**

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6 **When the auto installation process is completed, remove *EtherDisk* diskette 1 and reboot the PC.**

If you are running Windows 3.1x, after you connect to the NetWare server, run the INSTALL.EXE program for full Windows support. INSTALL.EXE gives you a full complement of NetWare requester installation files. Contact your network administrator to obtain this NetWare utility.

If problems occur only when you run AutoLink software, display or print the AUTOLINK.LOG file. This file contains a list of all events that occur during the AutoLink installation and configuration process.

- To display the file, enter:

  `type autolink.log | more`

- To print the file, enter:

  `print autolink.log`

Novell NetWare Server Driver

This section describes how to install the Novell NetWare driver on a Novell server running NetWare 3.12, 4.10, or 4.11. The NetWare 3.11 server is not supported by the 3C900B NIC.

The \NWSERVER directory on *EtherDisk* diskette 1 contains the network driver file (3C90X.LAN) to be used for servers running NetWare 3.12, 4.10, and 4.12. The NetWare Loadable Modules (NLMs) are additional files that are required for servers running NetWare 4.10 or 4.11. NLM files are also on *EtherDisk* diskette 1 in the same directory.

Obtain the most current NLMs from Novell.

NetWare 3.12

Follow these steps to install the driver in a NetWare 3.12 server:

1 **Obtain the MSM31X.NLM, ETHERTSM.NLM, and NBI31X.NLM files from Novell and copy them to the directory on your hard disk where other NLM files are located.**

2 **Copy the LAN driver file (3C90X.LAN) from *EtherDisk* diskette 1 to the same directory.**

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3 **Add the following two lines to the AUTOEXEC.NCF file:**

```
load C:\NWSERVER\3C90X.LAN slot=<slot>
   NAME=<name> FRAME=<frametype>
bind ipx to <name> net=<number>
```

4 **Save and exit the file, and then reboot the server.**

NetWare 4.10 and 4.11

Follow these steps to install the driver in a NetWare 4.10 or 4.11 server:

1 **Install the NetWare server software.**

The *NIC Selection* menu appears.

2 **Press Enter to display a list of NIC drivers.**

3 **Press Insert to install an unlisted driver.**

4 **Insert *EtherDisk* diskette 1 in drive A and press Enter.**

5 **Press Enter after the driver is loaded.**

6 **Save parameters and continue the installation.**

Multiple NICs

To support more than one NIC in a NetWare server, change the AUTOEXEC.NCF file to the following format:

```
load C:\NWSERVER\3C90X.LAN slot=<slot1>
   NAME=<name1> FRAME=<frametype1>
bind ipx to <name1> net=<net1>
load C:\NWSERVER\3C90X.LAN SLOT=<slot2>
   NAME=<name2> FRAME=<frametype2>
bind ipx to <name2> net=<net2>
```

The values <slot1> and <slot2> are the values of the PCI slots for the 3C900B NIC. You can use the 3Com DOS diagnostic program to verify the PCI slot number that the NIC is installed in. See Figure 2-1.

The values <name1> and <name2> are unique names assigned to each NIC by your network administrator. The values <name1> and <name 2> must be different names.

The frame parameter (frametype1 and frametype2) can be one of the following: Ethernet_802.2, Ethernet_802.3, Ethernet_II, or Ethernet_SNAP. Make sure that the frametype for the server and the workstation is the same.

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For example, if the server uses Ethernet_802.2, the workstation must also use Ethernet_802.2.

The values <net1> and <net2> are unique numbers assigned by the network administrator to each NIC. Make sure that <net1> and <net2> are different numbers.

See the appropriate Novell NetWare manuals for further information.

Follow these steps to verify the PCI slot number that the NIC is installed in:

1 **Reboot to a DOS prompt.**

2 **Insert *EtherDisk* diskette 1 in drive A, change to the A:\> prompt, and enter:**

`3c90xcfg.exe`

The Selected NIC screen of the Configuration and Diagnostic Program is displayed, as shown in Figure 2-1.

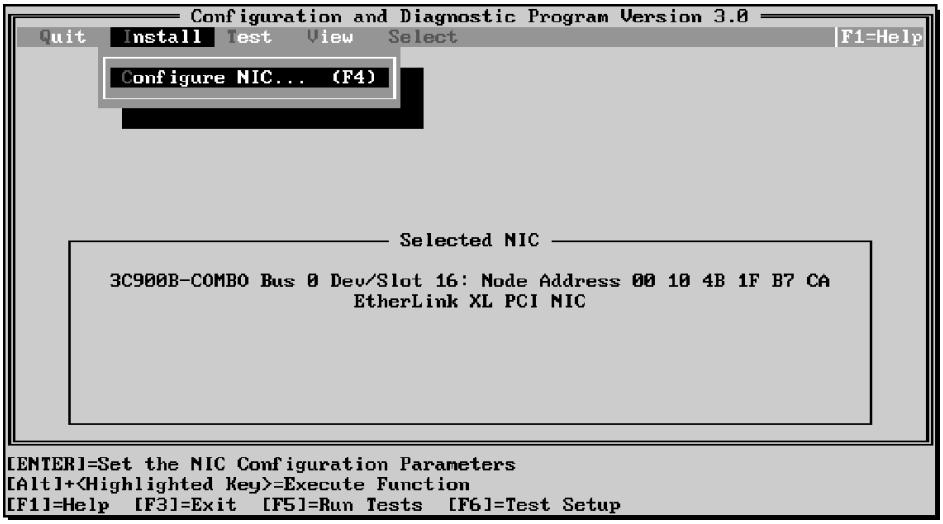

Figure 2-1 Selected NIC Screen of the Configuration and Diagnostic Program

3 **Check the slot number in the Selected NIC panel on the screen.**

The slot value that appears in the Selected NIC panel must match the slot value entered in the load line of the AUTOEXEC.NCF file.

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Supported Network Drivers

Table 2-1 provides the text file and driver names for supported network drivers. These text files, which describe how to install the associated network driver, are located in the HELP directory on *EtherDisk* diskette 1.

Table 2-1 Network Driver Text File Names

Network Operating System	Text File Name	Network Driver Name
Windows 95 Build 950	W95NDIS.TXT	EL90XND3.SYS
Windows 95 OSR2	W95NDIS.TXT	EL90XND4.SYS
Windows NT 4.0	WINNT.TXT	EL90XND4.SYS
Windows NT 3.51	WINNT.TXT	EL90XND3.SYS
NetWare Client 32	CLIENT32.TXT	3C90X.LAN
NetWare 4 Server	NETWARE.41X	3C90X.LAN
NetWare Client for OS/2	NWOS2ODI.TXT	3C90X.SYS
NetWare client for DOS, Windows 3.1, and Windows for Workgroups	NWDOSODI.TXT	3C90X.COM
Windows for Workgroups (NetWare)	WFWNETWR.TXT	3C90X.COM
Windows for Workgroups (NDIS 2)	WFWNDIS.TXT	EL90X.DOS
Windows for Workgroups (NDIS 3)	WFWNDIS.TXT	EL90X.386
Banyan VINES	BANYAN.TXT	EL90X.DOS
Microsoft LAN Manager	LANMAN.TXT	EL90X.DOS
IBM LAN Server (DOS)	LANSRV.TXT	EL90X.DOS
IBM LAN Server (OS/2)	LANSRV.TXT	EL90X.OS2
Artisoft LANtastic	LANTASTK.TXT	EL90X.DOS
DEC PATHWORKS	PATHWORK.TXT	EL90X.DOS (DOS)
DEC PATHWORKS	PATHWORK.TXT	3C90X.COM (NetWare ODI-compatible)

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3 TROUBLESHOOTING INSTALLATION PROBLEMS

This chapter explains how to use troubleshooting techniques and 3Com diagnostic programs to isolate and solve problems that may occur when you install the 3C900B NIC.

If you have trouble installing your 3C900B NIC, follow these basic troubleshooting tips before you run the diagnostic programs.

CAUTION: *Before inserting or removing the NIC from the PC, turn the PC power off.*

- Check the NIC installation by reviewing Chapter 1. Make sure that the NIC is seated correctly in the slot. Check for specific hardware problems, such as broken traces or loose or broken solder connections.
- Inspect all cables and connections. Check the length and rating of the cable. Make sure that the cable complies with 10BASE-T recommendations.
- Make sure that you are running the latest BIOS for your PC. If your BIOS has not been upgraded in the previous 12 months, contact your PC manufacturer to obtain the current version of your BIOS software.
- Replace the failed NIC with a working NIC and run the diagnostic tests again, using the same option settings as those used on the failed NIC. If the working NIC passes all tests, the original NIC is probably defective. For information on product repair, see Appendix D.

Running Diagnostic Programs

This section provides information about how to run 3Com diagnostic programs to resolve problems that may occur during NIC installation. If you are running DOS, Windows 3.x, Windows for Workgroups, or Windows NT 3.51, use the 3Com DOS diagnostic program. If you are running Windows 95 or Windows NT 4.0, use the 3Com NIC Diagnostics program.

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3Com DOS Diagnostic Program

Use the 3Com DOS diagnostic program to troubleshoot problems or change configuration settings for a 3C900B NIC installed in a PC running DOS, Windows 3.x, Windows for Workgroups, or Windows NT 3.51. For information about running the 3Com DOS diagnostic program, see the INSTRUCT.TXT file in the HELP directory on *EtherDisk* diskette 1.

3Com NIC Diagnostics Program

This section describes how to use the 3Com NIC Diagnostics program to run diagnostic tests on a 3C900B NIC installed in a PC running Windows 95 or Windows NT 4.0. You can also use this program to change NIC configuration settings after the NIC and the NIC software are installed. To change NIC configuration settings, see Chapter 4.

The 3Com NIC Diagnostics program is installed when you install the network driver for the 3C900B NIC. The network driver must be installed before you can run the 3Com NIC Diagnostics program.

Running NIC Tests

Run the NIC tests to check the physical components, connectors, and circuitry on the NIC. Make sure that the NIC is installed and connected to the network (Chapter 1) and the network driver is installed (Chapter 2) before running NIC tests.

Follow these steps to start the 3Com NIC Diagnostics program and run the NIC tests:

1 **Double-click the 3Com icon in the Windows system tray.**

A warning message appears.

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If the 3Com icon has been disabled and is not visible in the system tray, follow these steps:

a Click *Start* in the Windows taskbar.

b Select *Programs*, and then select *3Com NIC Utilities.*

c Click *3nicdiag.*

A warning message appears.

2 Click *OK* to disconnect your PC from the network to conduct this test.

You will be automatically reconnected to the network at the completion of the tests.

The 3Com NIC Diagnostics General screen appears, as shown in Figure 3-1.

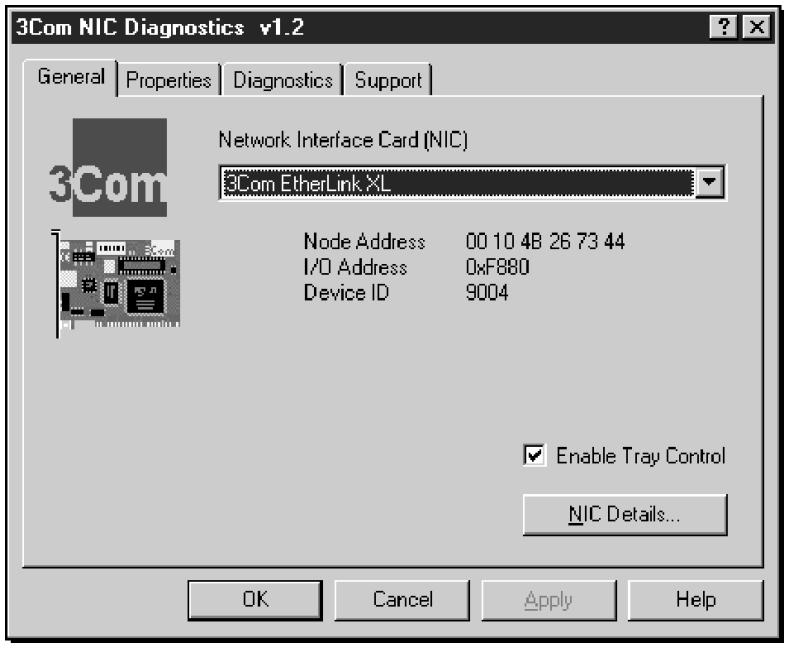

Figure 3-1 3Com NIC Diagnostics General Screen

3 Click the Diagnostics tab.

The Diagnostics screen is displayed, as shown in Figure 3-2.

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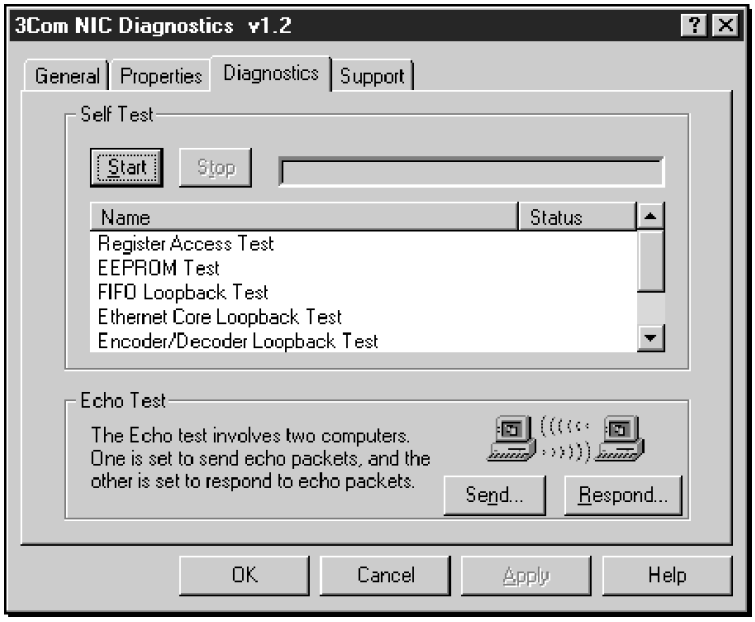

Figure 3-2 Diagnostics Screen

4 Click *Start*.

A six-test sequence begins. The test status is displayed in the Status column as each test is completed. You can click *Stop* to stop the tests at any point.

Click the Help button on the screen to obtain general information about the function of the screen. To obtain specific information about any topic on the screen, click the question mark (?) at the top of the screen, move it over the topic, and click. A pop-up box displays information about the topic.

Running the Echo Test

Run the Echo test to test the ability of the NIC to transmit and receive data while it is connected to the network. To run the Echo test, you need two PCs networked together. In addition, the two PCs must each have a 3Com NIC installed. Also make sure that the network driver is installed. The first PC is used to send data; the second PC receives the data sent from the first PC.

CAUTION: *Running the Echo test while connected to an active network can cause intermittent failures within the test.*

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Follow these steps to run the Echo test:

1 **On both PCs:**

a Click the Windows *Start* menu.

b Select *Programs*.

c Select *3Com NIC Utilities*.

d Click *3nicdiag.*

e Click the Diagnostics tab to display the Diagnostics screen, shown in Figure 3-2.

2 **On the responding PC:**

a Click *Respond* on the Diagnostics screen (Figure 3-2).

The Echo Test Responder screen is displayed, as shown in Figure 3-3.

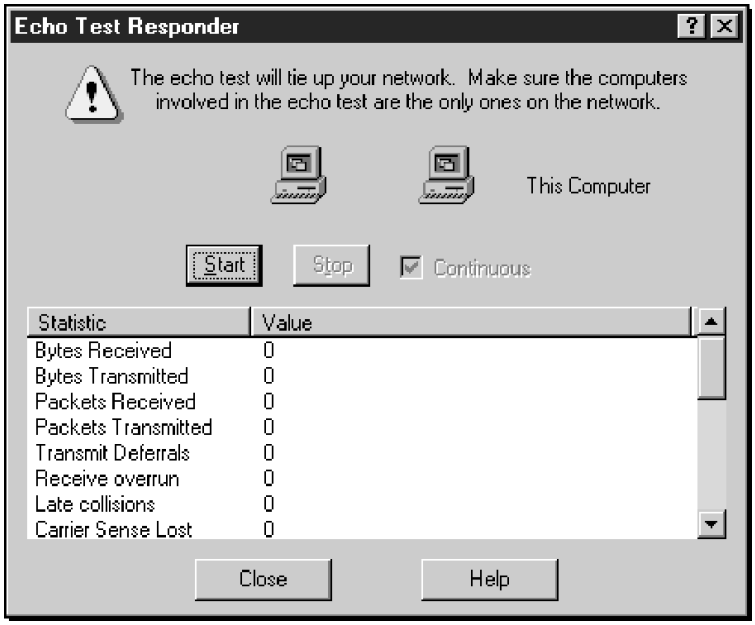

Figure 3-3 Echo Test Responder Screen

b Click *Start* on the Echo Test Responder screen.

3 **On the sending PC:**

a Click *Send* on the Diagnostics screen (Figure 3-2).

The Echo Test Sender screen appears on the sending PC, as shown in Figure 3-4.

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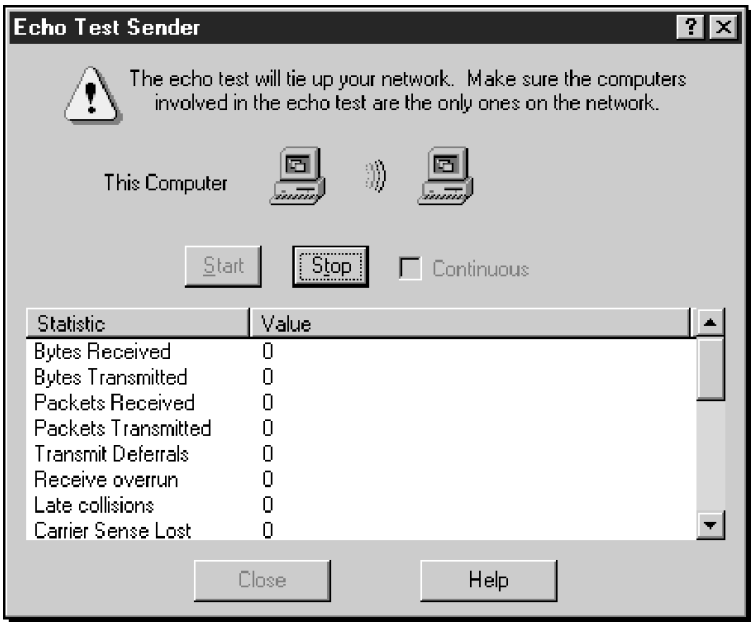

Figure 3-4 Echo Test Sender Screen

b Click *Start* on the Echo Test Sender screen (Figure 3-4).

Test statistics appear in the list box of the window, as shown in Figure 3-5.

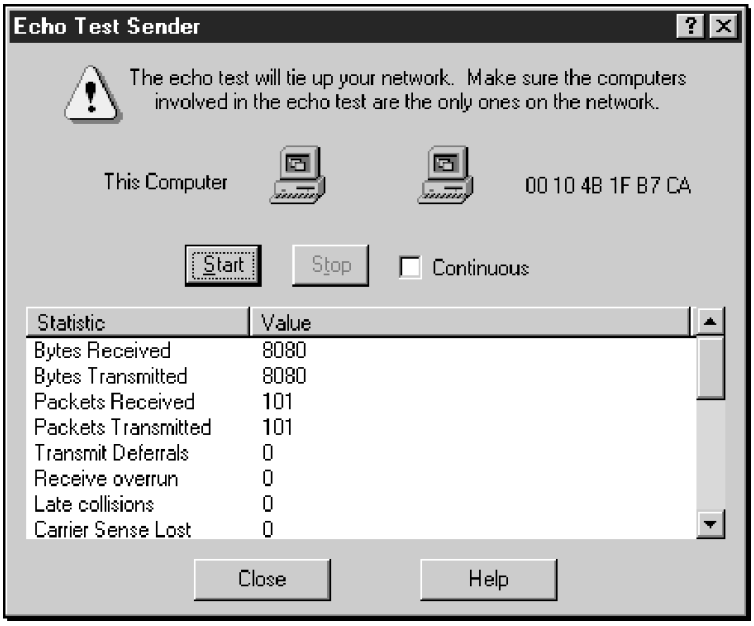

Figure 3-5 Echo Test Statistics Screen

c Close all open windows when the Echo test is finished.

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3Com Support Services

The Support screen of the 3Com NIC Diagnostics program provides access to several support services. Click the Support tab on the 3Com Diagnostics General screen to display the Support screen, shown in Figure 3-6.

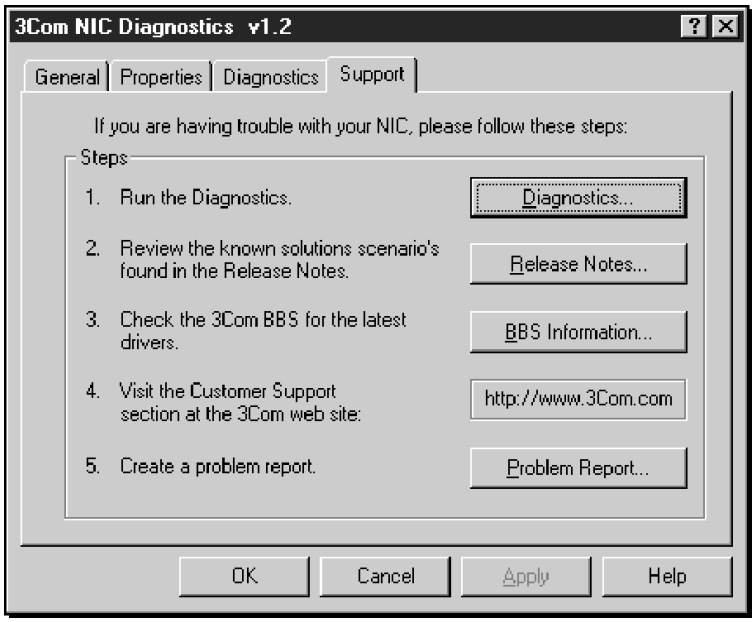

Figure 3-6 3Com NIC Diagnostics Support Screen

- Click *Diagnostics* to run the 3Com NIC Diagnostics program. Refer to the beginning of this chapter for information on how to use the 3Com NIC Diagnostics program.
- Click *Release Notes* to display customer support information databases about the 3C900B NIC in three categories: release notes, frequently asked questions, and the KnowledgeBase.
- Click *BBS Information* to display the BBS telephone numbers and modem speeds.
- Click *http://www.3com.com* to go to the home page on the 3Com World Wide Web site.
- Click *Problem Report* if you want to generate a problem report about a 3C900B NIC problem. You can e-mail this problem report to 3Com.

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Accessing the Help System

The 3C900B NIC Help system is a Windows Help application that includes 3C900B release notes, frequently asked questions, and a KnowledgeBase of known compatibility issues. You must install the 3C900B NIC and the network driver before you can access the Help system.

Follow these steps to access the 3C900B NIC Help system:

1. **Click *Start* in the Windows taskbar, select *Programs*, and select *3Com NIC Utilities*.**
2. **Click *3nichelp*.**

   The 3Com NIC Diagnostics General tab appears.
3. **Click the links and tabs to display information about each of the four 3Com NIC Diagnostics program tabs.**

Release Notes, Frequently Asked Questions, and KnowledgeBase Topics

The Help application within the 3Com NIC Diagnostics program contains a substantial database of support-related and service-related data that you can access in the following categories: release notes, frequently asked questions, and KnowledgeBase topics.

Follow these steps to access the support database:

1. **Click the Support tab.**

   The Support screen is displayed.
2. **Click *Release Notes*.**

   The Release Notes Help screen appears.
   - Click the Release Notes link to display tips about installing and using the 3C900B NIC.
   - Click the Frequently Asked Questions link to display common questions asked by customers and answered by 3Com support experts.
   - Click the KnowledgeBase link to display 3C900B NIC compatibility topics.

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Click the Help button on the screen to obtain general information about the function of the screen. To obtain specific information about any topic on the screen, click the question mark (?) at the top of the screen, move it over the topic, and click. A pop-up box displays information about the topic.

Removing NIC Software

Windows 95 and Windows NT 4.0

Follow these steps to remove the 3C900B NIC software:

1. **Double-click the My Computer icon, double-click the Control Panel icon, and double-click the Network icon.**

   The Network Window appears, displaying the Configuration screen.

2. **Select the name of the NIC in the installed components list, click *Remove*, and then click *OK*.**

   The 3C900B NIC driver and diagnostic software are removed from the PC.

   Windows prompts you to restart the computer.

   - If you are physically removing the NIC from the PC, click *No*. Do not restart the PC until you shut down the system, turn the power off, and remove the NIC from the PC.
   - If you are reinstalling the NIC software, click *Yes*.

Windows NT 3.51

Follow these steps to remove the 3C900B NIC software:

1. **In the Main Program window, double-click the Control Panel icon, and double-click the Network icon.**

   The Network Settings window is displayed.

2. **In the Installed Adapter Cards panel, select the name of the installed NIC and click *Remove*.**

   The Network Settings window displays a warning message.

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3 **Click *Yes*.**

The Network Settings window is displayed. The 3C900B NIC no longer appears in the Installed Adapter Cards panel.

4 **Click *OK*.**

The 3C900B NIC driver and diagnostic software are removed from the PC.

The Network Settings Change dialog box is displayed, prompting you to restart.

- If you are physically removing the NIC from the PC, click *No*. Do not restart the PC until you shut down the system, turn the power off, and remove the NIC from the PC.
- If you are reinstalling the NIC software, click *Restart Now*.

Frequently Asked Questions

Table 3-1 describes some common questions and answers about the 3C900B NIC.

Table 3-1 Frequently Asked Questions

Question	Answer
Which PCI slot should I use for my PCI NIC?	3Com PCI NICs are designed to work in any bus-mastering PCI slot, preferably slot 1. Avoid any PCI slot next to an ISA slot. This is often a shared slot and does not support bus mastering. The NICs perform best in those slots that support bus-mastering data transfers. Refer to your PC manual for information on which slots support bus-mastering data transfers.
Do I have to configure the 3C900B NIC?	PCI is a self-configuring bus architecture. Most of the time you only need to install the board in your PC; PCI does the rest. However, on some PCI computers, you may be required to configure the computer's BIOS manually after installing your PCI NIC. Refer to the owner's guide for your PC.

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Table 3-1 Frequently Asked Questions (continued)

Question	Answer
What interrupts should I avoid?	You should avoid using any interrupts used by ISA/EISA boards that do not properly support shared interrupts (level-triggered). If you do not know or are unsure whether other devices or adapters in your PC support shared interrupts, then avoid using them. Avoid using the same interrupt as your local hard disk (normally IRQ 14 for IDE drives and IRQ 11 for most SCSI host adapters), because not all hard disks support shared interrupts at this time. Avoid using 9 because it cascades with 2. For Novell NetWare servers, avoid using IRQ 7 or 15. These IRQs support only nonshared devices and may cause problems if they are shared between two devices.
Are my EtherLink XL network drivers Microsoft-certified?	Yes.
Are my EtherLink XL bus-master ODI drivers Novell-certified?	Yes.
How do I remove the 3Com icon from my Windows 95 system tray?	**1** Double-click the 3Com icon to start the 3Com NIC Diagnostics program. **2** In the bottom-right corner of the main window, click the Enable Tray Control check box to remove the check mark. **3** Exit the program and the icon will not appear anymore.
Where can I get a SCO driver?	Obtain the SCO driver from the 3Com World Wide Web site: **`http://www.3com.com/`**
Does the 3C900B NIC support full-duplex?	Yes, the 3C900B NIC supports full-duplex at 10 Mbps.
Why does the 3C900B NIC install as a "Generic PCI Ethernet Controller" under Other Devices in the Windows 95 Device Manager?	When Windows 95 is installed after the 3C900B NIC has already been installed, Windows 95 installs the NIC as a generic PCI Ethernet controller. To work around this problem, follow these steps: **1** In the Device Manager, double-click *Other Devices*. **2** Click *PCI Ethernet Controller*. **3** Click *Remove*. **4** Restart your PC.

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Table 3-1 Frequently Asked Questions (continued)

Question	Answer
Does the 3C900B NIC support Windows NT version 3.51 on the DEC Alpha PC?	The 3C900B NIC network driver supports only Windows NT 4.0.
In Windows 95, what should I do if a yellow exclamation point (!) appears next to the NIC name?	**1** In the Device Manager, double-click *Other Devices*. **2** Click *PCI Ethernet Controller* or the duplicate PCI NIC entry. **3** Click *Remove*. **4** Restart your PC.
What is the hardware IP header checksum?	The header checksum is a field in the IP header. When the NIC receives IP data, it computes the IP header checksum. If an error occurs, the packet is dropped and not passed to the protocol stack. By computing the CRC through hardware, the NIC can increase the performance of IP traffic and reduce CPU processing required by the protocol stack. To avoid having the CRC computed twice (once in the hardware and again in the software by the protocol stack), make sure that your IP protocol does not compute the CRC, or if it does, disable that function.
Does the 3C900B NIC support NetWare versions 3.11 or 4.0x?	The 3C900B NIC does not support NetWare versions 3.11 or 4.0x. These versions require the use of a server driver that conforms to the HSM 3.2 specification. 3Com no longer develops NetWare server drivers that conform to the HSM 3.2 specification.
What is Fast IP?	Fast IP is software that improves performance on switched networks. Fast IP allows end systems (workstations and servers) to discover switched communication paths. By creating switched shortcuts, Fast IP allows end stations to bypass the router and transfer data across wire-speed switched paths. Fast IP is part of 3Com's Dynamic*Access* software, an advanced network driver that brings intelligence to end systems to provide improved network performance and control.

(continued)

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Table 3-1 Frequently Asked Questions (continued)

Question	Answer
What are the PC and network requirements to run Fast IP?	■ Client requirements: PC running Windows 95 or Windows NT (versions 4 or 3.51), 3Com 3C900B NIC, and the TCP/IP stack ■ Network requirements: Switched path between stations and single broadcast domain
What are the network configuration requirements for Fast IP?	Fast IP is designed to bypass the router, particularly where the router is a bottleneck, as well as to leverage the switched infrastructure. For Fast IP to create shortcuts around routers, there must be a switched path between source and destination.
What is the performance gain when using Fast IP?	Fast IP bypasses the router to provide increased performance in switched networks even if only a small number of network nodes use Fast IP. The performance gain obtained when deploying Fast IP is directly related to traffic load on the backbone router. The more traffic pumped to the router, the greater the latency and response time and the higher the performance gain. Internal tests show performance increases on the order of 600% when routers are loaded at 70 to 75%.

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4 CHANGING CONFIGURATION SETTINGS

This chapter describes how to display and change configuration settings for the 3C900B NIC using 3Com diagnostic programs.

Before you change the settings, contact your system administrator.

Table 4-1 lists the configurable options for the 3C900B NIC, the default setting for each option, and other settings that are available for each option.

Table 4-1 Option Settings

Option	Default Setting	Available Settings
Network Driver Optimization	Normal	Minimized CPU Utilization, Maximized Network Performance, Normal
Full-Duplex	Half-Duplex	Half-Duplex, Full-Duplex
Boot PROM	Disabled	Disabled, 64K, 128K
Media Type	Auto Select	10BASE-T (10Mb/s), Auto Select, 10BASE-2 (10Mb/s), AUI (10Mb/s)
PACE (Windows 95 and Windows NT 4.0 only)	Disabled	Enabled, Disabled

The 3C900B NIC supports full-duplex at 10 Mbps. If the switch that you are connected to supports autonegotiation and full-duplex, the 3C900B NIC automatically runs in full-duplex mode.

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Using the DOS Configuration Program

The configuration section of the DOS diagnostic program is used to configure the 3C900B NIC when it is installed in a PC running DOS, Windows 3.x, Windows for Workgroups, or Windows NT 3.51. To use the configuration portion of the DOS diagnostic program, see the INSTRUCT.TXT file in the HELP directory on *EtherDisk* diskette 1.

Running the 3Com NIC Diagnostics Program

If you are running Windows 95 or Windows NT 4.0, run the 3Com NIC Diagnostics program to display and change configuration settings.

The 3Com NIC Diagnostics program is automatically installed when you install the network driver.

Displaying Configuration Settings

Follow these steps to run the 3Com NIC Diagnostics program to display the current configuration settings for the 3C900B NIC:

1. **Make sure that the NIC is installed and connected to the network and the network driver is installed.**
2. **Double-click the 3Com icon in the system tray.**

   A warning message appears.

   If the 3Com icon has been disabled and is not visible in the system tray, follow this procedure:

   a Click *Start* in the Windows taskbar.

   b Select *Programs*, and then select *3Com NIC Utilities*.

   c Click *3nicdiag.*

   A warning message appears.

   The 3Com NIC Diagnostics General screen appears, as shown in Figure 4-1.

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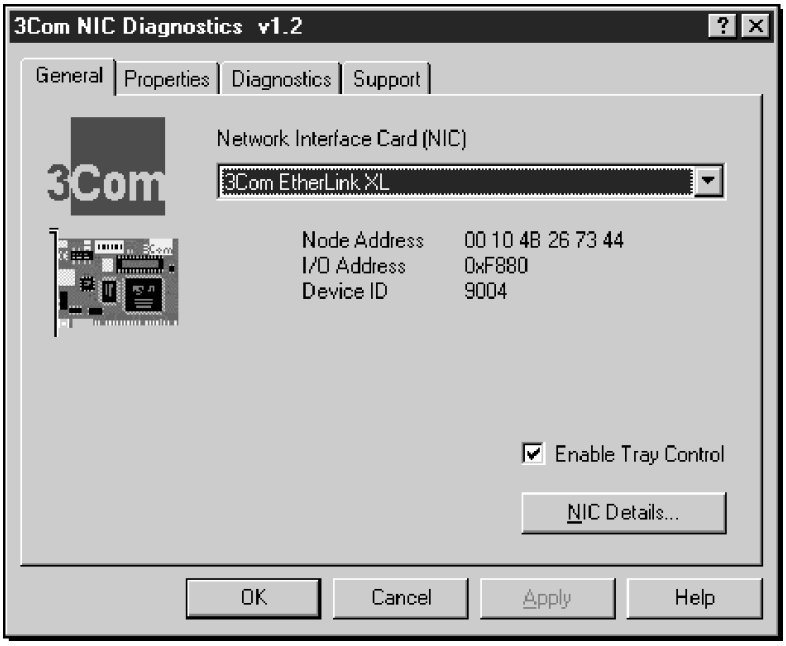

Figure 4-1 3Com NIC Diagnostics General Screen

3 Click *NIC Details* to display the NIC Details screen, as shown in Figure 4-2.

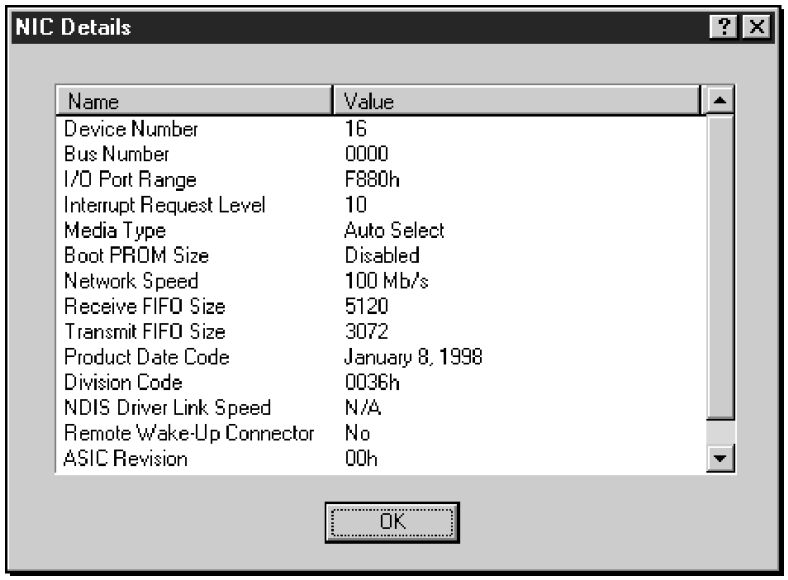

Figure 4-2 NIC Details Screen

Each configuration setting is displayed with the current value. Use the scroll bar to display the full list.

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If a Help button appears on a screen, click the Help button to obtain general information about the function of the screen. To obtain specific information about any topic on the screen, click the question mark (?) at the top of the screen, move it over the topic, and click. A pop-up box displays more detailed information about the topic.

Changing Configuration Settings

Follow these steps to change 3C900B NIC configuration settings using the 3Com NIC Diagnostics program:

1 **Click the Properties tab on the 3Com NIC Diagnostics General screen, shown in Figure 4-1.**

The 3Com NIC Diagnostics Properties screen appears, as shown in Figure 4-3.

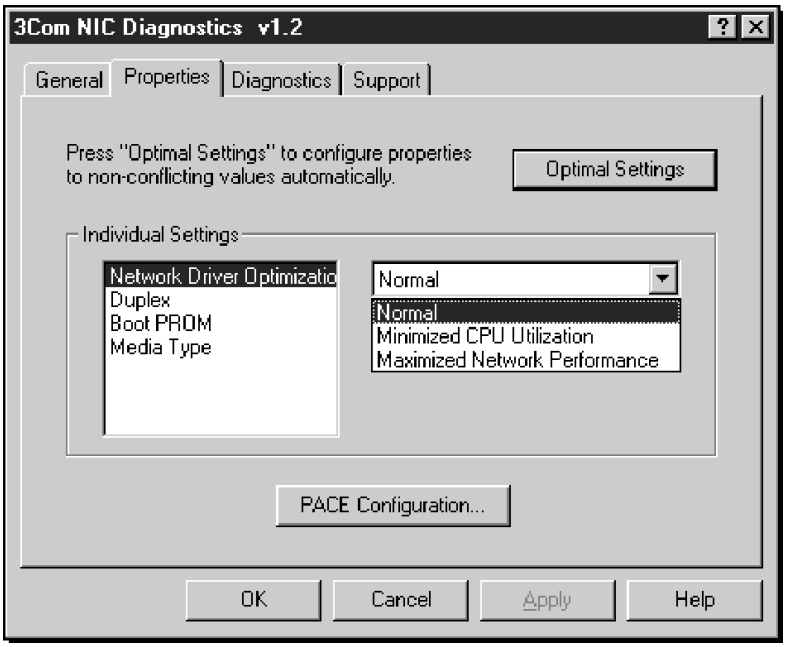

Figure 4-3 3Com NIC Diagnostics Properties Screen

2 **In the Individual Settings panel, select a configurable item (left pane) and click the arrow (right pane) to display available options.**

3 **Select a new value from the list of available options.**

4 **Click *OK*.**

Repeat the process to change any other setting on the Properties screen. Click *OK* to save values or *Cancel* to exit without saving values.

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Enabling PACE Support

PACE technology enables you to establish class-of-service ranking to prioritize multimedia and real-time network data traffic. Prioritization makes sure that critical data for selected applications gets through as fast as possible. PACE is automatically installed on your PC when you install the NIC software.

Follow these steps to select applications for PACE support:

1 **On the Properties screen shown in Figure 4-3, click *PACE Configuration*.**

The 3Com Dynamic*Access* Setup screen appears, as shown in Figure 4-4.

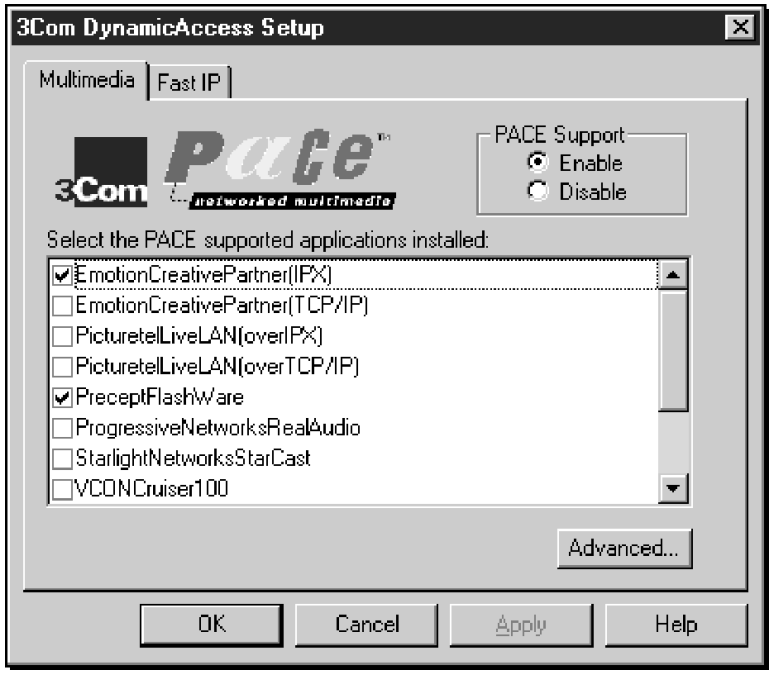

Figure 4-4 3Com Dynamic*Access* Setup Screen

2 **Select the *Enable* radio button in the PACE Support panel.**

3 **To enable PACE support for an application, click the check box to the left of the application name.**

4 **Click *OK*.**

To configure advanced PACE options, see Appendix B.

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A SPECIFICATIONS AND CABLING REQUIREMENTS

This appendix lists the specifications, cable requirements, and connector pin assignments for the 3C900B NIC.

Specifications

Network Interface

10 Mbps Ethernet 10BASE-T	Ethernet IEEE 802.3 industry standard for a 10 Mbps baseband CSMA/CD local area network

Physical Dimensions

TPO

Length:	12.19 cm (4.80 in)
Width:	7.62 cm (3.00 in)

COMBO

Length:	17.32 cm (6.82 in)
Width:	10.03 cm (3.95 in)

Environmental Operating Range

Operating temperature:	0˚ to 70 ˚C (32˚ to 158 ˚F)
Humidity:	10 to 90% noncondensing

Power Requirements

Operating voltage:	+5 V ± 5% @ 650 mA max

Cabling Requirements

The cable, quality, distance, and connectors must comply with the Electronic Industries Association/Telecommunications Industries Association (EIA/TIA) 568 *Commercial Building Wiring Standard* and the Technical Services Bulletin TSB38 standards.

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Twisted-Pair Cable

Twisted-pair cable consists of copper wires surrounded by an insulator. Two wires are twisted together (the twisting prevents interference problems) to form a pair, and the pair forms a circuit that can transmit data. A cable is a bundle of one or more twisted pairs surrounded by an insulator.

Unshielded twisted pair (UTP) is the most commonly used type of twisted-pair cable. Shielded twisted pair (STP) provides protection against crosstalk. Twisted-pair cable is now commonly used in Ethernet, Fast Ethernet, and other network topologies.

The EIA/TIA defines five categories of unshielded twisted-pair cable (see Table A-1).

Table A-1 Unshielded Twisted-pair Cable Categories

Category	Use
1	Traditional telephone cable.
2	Data transmissions up to 4 MHz.
3	Voice and data transmission up to 25 MHz. The cable typically has four pairs of wires. Category 3 is the most common type of installed cable found in older corporate wiring schemes.
4	Voice and data transmission up to 33 MHz. The cable normally has four pairs of wire. This grade of UTP is not common.
5	Voice and data transmission up to 125 MHz. The cable normally has four pairs of copper wire and three twists per foot. Category 5 UTP is the most popular cable used in new installations today.

10BASE-T Operation

10BASE-T is the Institute of Electrical and Electronics Engineers (IEEE) 802.3 standard for Ethernet signaling over unshielded twisted-pair wire at 10 Mbps.

Ethernet, as the most widely used network protocol, uses 10BASE-T as its primary cabling scheme. Ethernet's characteristics include:

- A data rate of 10 Mbps
- A broadcast architecture
- A specific media-access control (MAC) scheme

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10BASE-T Specifications

The 10BASE-T name indicates a signaling speed of 10 Mbps and twisted-pair wiring. *Base* stands for baseband, which denotes a technique for transmitting signals as direct-current pulses rather than modulating them onto separate carrier frequencies.

A wiring topology using 10BASE-T specifies a wiring hub, cable arranged in a star configuration, and unshielded twisted-pair cable. Each node has a separate cable run that must not exceed 100 meters (328 ft) from the node to the hub.

RJ-45 Connector Pin Assignments

Figure A-1 shows the RJ-45 connector pin assignments for the 3C900B NIC.

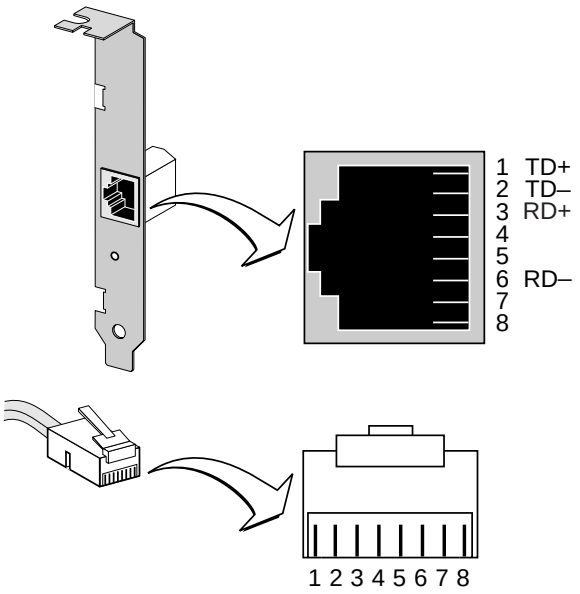

Figure A-1 RJ-45 Connector Pin Assignments

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B CONFIGURING ADVANCED PACE OPTIONS

This appendix describes how to use advanced PACE options to configure operational settings and additional ranges and protocols of applications for which you have enabled PACE support.

Advanced PACE options allow you to change ranges, add protocols, and define operational settings that regulate network traffic for PACE-supported applications running on your PC. When you install a new application on your PC that you want to have supported by PACE, use the advanced PACE options to configure the new application for PACE support. Refer to the user guide that came with the PACE-supported application for specific range and protocol information.

Operational Settings

The following operational settings can be modified to regulate PACE traffic on the network.

FIFO Packet Threshold

This setting controls the number of non-PACE packets that the network driver allows in the FIFO buffer, ahead of PACE packets. A smaller number decreases the time between PACE packets, but it can also decrease performance. The recommended setting is 3.

Concurrent UDP Streams

This setting controls the number of simultaneous multimedia UDP packet streams that the network driver can handle at any given time. For many applications, the number of UDP streams is the same as the number of connections.

For example, a videoconference with three people at three different sites uses three concurrent UDP streams for the video data. The concurrent UDP streams setting must be a power of 2 (2, 4, 8, 16, and so forth), but the optimal setting varies depending on your PC and the application that you are running.

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Although a video server can support up to 32 connections, a client may want to conference with only four other people at a time. The recommended setting is 16.

Low-Priority Ratio

When PACE support is enabled, high-priority packets are always transmitted before low-priority packets. If a high-priority, PACE-supported application sends out a sufficiently large number of high-priority packets, then low-priority packets from other PACE-supported applications may not be sent.

To prevent this problem, the PACE driver uses a ratio setting to periodically send out a low-priority packet (if a low-priority packet is waiting to be sent). For example, if a value of 100 is entered, one low-priority packet would be sent for every 100 high-priority packets. The recommended setting is 25.

Natural Packet Interval

The PACE driver slightly modifies the Ethernet packet to facilitate communication of packet priorities to interconnect devices (repeaters, switches, and the like). Consequently, connection problems may result when these modified packets are sent out for long periods, during which no low-priority packets are sent. To get around this problem, the PACE driver can be configured to periodically send out an unaltered, natural packet. The recommended setting is 180 (seconds).

Option Descriptions

The following advanced options can be enabled or disabled to regulate packets.

Disable Switch Packet Prioritization

This option disables modification of Ethernet packets used for prioritization of multimedia traffic within 3Com switch products. For example, disabling switch packet prioritization can sometimes prevent multimedia-connection failures between a PACE-enabled workstation and a non-PACE workstation.

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Disabling switch packet prioritization affects only the switch; it does not change the behavior of the PACE driver in any way. Regardless of the switch setting, high-priority packets are transmitted ahead of most non-PACE packets on the workstation.

Disable Receive Packet Buffering

This option disables the receive packet buffer.

Changing Operational Settings

Follow these steps to change PACE operational settings:

1 **Click the *Advanced* button on the 3Com Dynamic*Access* Setup screen (Figure 4-4).**

The Advanced PACE Options screen is displayed, as shown in Figure B-1.

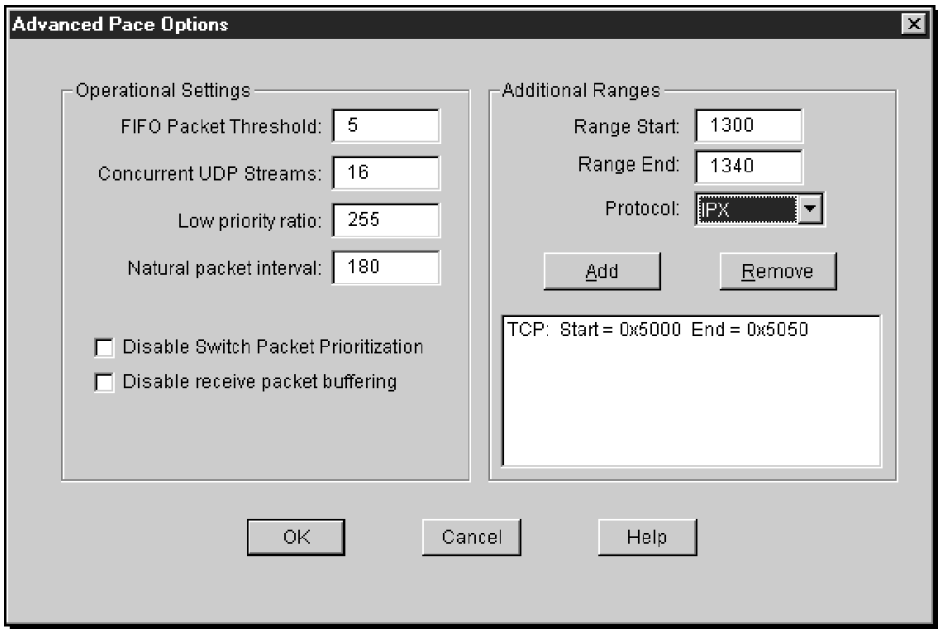

Figure B-1 Advanced PACE Options Screen

2 **Enter data in the fields provided.**

3 **Select the check boxes if you want to disable switch packet prioritization or receive packet buffering.**

4 **Go to the next section.**

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Changing Ranges and Protocols

Follow these steps to change PACE ranges and protocols:

1. **Place the cursor in the Range Start entry box and enter a port or socket start range for the application.**
2. **Place the cursor in the Range End entry box and enter a port or socket end range for the application.**
3. **In the Protocol selection box, click the down arrow to display a list of the installed protocols on your PC.**
4. **Select the appropriate protocol for the application. Refer to the application's user guide for the recommended protocol.**

   Some applications support multiple protocols and use different port or socket ranges for each protocol. If the application in question uses multiple protocols, the range and protocol must match those on your PC.

   For example, if TCP/IP is the only protocol installed on your PC, do not enter the socket range for the IPX protocol. Use the range for TCP/IP.
5. **Click *Add*.**

   The range appears in the list box.

   To remove a range, select the range in the list box and click *Remove*.
6. **Click *OK* to return to the 3Com Dynamic*Access* Setup screen (Figure 4-4).**

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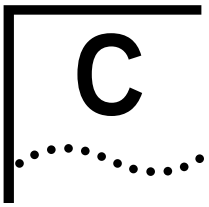

TROUBLESHOOTING NETWORK CONNECTION PROBLEMS

This appendix provides information about using a crossover cable to troubleshoot network problems when you know that the 3C900B NIC is working, but you cannot send or receive network traffic.

When you work with 10BASE-T cabling, concentrators, and NICs from different vendors, it is possible to connect everything but still have no communication between file servers and workstations. When there are several unknown variables, it is difficult to determine which component is failing.

Eliminating Potential Causes of Problems

Follow these steps to narrow the range of possible causes of some common problems:

1 **Determine whether your equipment complies with the 10BASE-T standard.**

This is particularly important for data concentrators (hubs or repeaters).

2 **Connect a straight-through cable from the PC to the hub.**

The hub performs an internal crossover so that the signal can go from TD+ to RD+ and TD– to RD–. When you look at an RJ-45 connector from the front (that is, the opposite side from where the wires enter the connector), pin 1 is identified on the right-hand side when the metal contacts are facing up.

3 **Make sure that the TD+ and TD– wires are twisted together, and that the RD+ and RD– wires are twisted together.**

Using wires from opposing pairs can cause signals to be lost.

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Troubleshooting Hubs with Crossover Cable

A crossover cable can be used to identify the type of failure when hub performance or connectivity is in question.

1 **Connect a file server and a client PC back to back with a crossover cable to verify that the NIC and network operating system are properly configured.**

2 **To make a crossover cable, connect TD+ to RD+ and TD– to RD–.**

The cable performs the crossover that is usually performed by the hub. Figure C-1 shows the pinouts for the crossover cable:

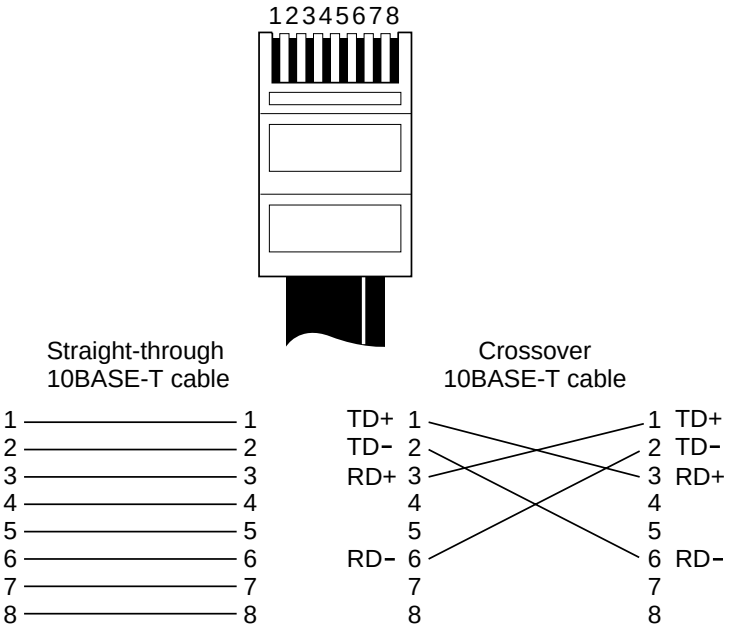

Figure C-1 Straight-through and Crossover Cable Pinouts

If the file server and client PC function together as a small network, then either the existing cabling or the hub is failing.

When a crossover cable is used, the LED on the NIC functions differently than it would under normal operating conditions. For example, with a correct crossover connection, the LED lights, whereas with a straight-through connection, the LED does not light. If you make a crossover cable and the polarity is mismatched (that is, TD+ to RD– instead of TD+ to RD+), the LED blinks.

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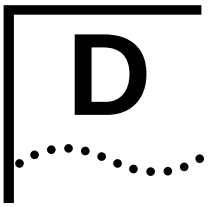

TECHNICAL SUPPORT

Support from Your Network Supplier

If assistance is required, contact your computer supplier for support and service of your 3Com network interface card. When you contact your for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Bulletin Board Service (3Com BBS)
- 3ComFacts℠ automated fax service

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World Wide Web Site

Access the latest networking information on the 3Com Corporation World Wide Web site by entering the URL into your Internet browser:

http://www.3com.com/

This service provides access to online support information such as technical documentation and software library, as well as support options ranging from technical education to maintenance and professional services.

3Com Bulletin Board Service

The 3Com BBS contains patches, software, and drivers for 3Com products. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	Up to 14,400 bps	61 2 9955 2073
Brazil	Up to 14,400 bps	55 11 5181 9666
France	Up to 14,400 bps	33 1 6986 6954
Germany	Up to 28,800 bps	4989 62732 188
Hong Kong	Up to 14,400 bps	852 2537 5601
Italy	Up to 14,400 bps	39 2 27300680
Japan	Up to 14,400 bps	81 3 3345 7266
Mexico	Up to 28,800 bps	52 5 520 7835
P.R. of China	Up to 14,400 bps	86 10 684 92351
Taiwan, R.O.C.	Up to 14,400 bps	886 2 377 5840
U.K.	Up to 28,800 bps	44 1442 438278
U.S.A.	Up to 28,800 bps	1 408 980 8204

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Access by Digital Modem

ISDN users can dial in to the 3Com BBS using a digital modem for fast access up to 56 Kbps. To access the 3Com BBS using ISDN, use the following number:

1 408 654 2703

3ComFacts Automated Fax Service

The 3ComFacts automated fax service provides technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone:

1 408 727 7021

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3Com Corporation LIMITED WARRANTY

HARDWARE

3Com warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following lengths of time from the date of purchase from 3Com or its authorized reseller:

Network Interface Cards	Lifetime
Other hardware products *unless otherwise specified above	1 year*
Spare parts and spares kits	90 days

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FCC CLASS B STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1 This device may not cause harmful interference, and

2 This device must accept any interference received, including interference that may cause undesired operation.

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WARNING: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules, and the Canadian Department of Communications Equipment Standards entitled, "Digital Apparatus," ICES-003.These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from the one which the receiver is connected to.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

NOTE: In order to maintain compliance with the limits of a Class B digital device, 3Com requires that you use quality interface cables when connecting to this device. Changes or modifications not expressly approved by 3Com could void the user's authority to operate this equipment. Refer to the manual for specifications on cabling types.

FCC Declaration of Conformity

We declare under our sole responsibility that the

Model:	**Description:**
3C900B	EtherLink XL PCI 10 Mbps Network Interface Card

to which this declaration relates, is in conformity with the following standards or other normative documents:

- ANSI C63.4-1992 Methods of Measurement
- Federal Communications Commission 47 CFR Part 15, subpart B
  15.107 (a) Class B Conducted Limits
  15.109 (a) Class B Radiated Emissions Limits
- 15.107 (e) Class B Conducted Limits
  15.109 (g) Class B Radiated Emissions Limits

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